



Deposition Sciences, Inc.
Quality Coating Solutions

DARK MIRROR COATINGS

Technical Data Sheet



PRODUCT DESCRIPTION

Dark mirror coatings absorb incident light rather than reflecting or transmitting it. They exhibit both the low transmittance of a metal and the low reflectance of an antireflection coating. DSI dark mirrors are distinguished by their broadband spectral performance and exceptional environmental durability. They can be designed for use in wavelength regions from the visible through the longwave infrared. In addition, DSI's photolithography capability enables the production of dark mirrors in precise patterns ranging from circular to more complex geometries.

APPLICATIONS

Dark mirrors are typically used to define the aperture of an optical system where control of stray light or elimination of crosstalk is critical. Applications include:

- High-performance imaging
- Multispectral sensors

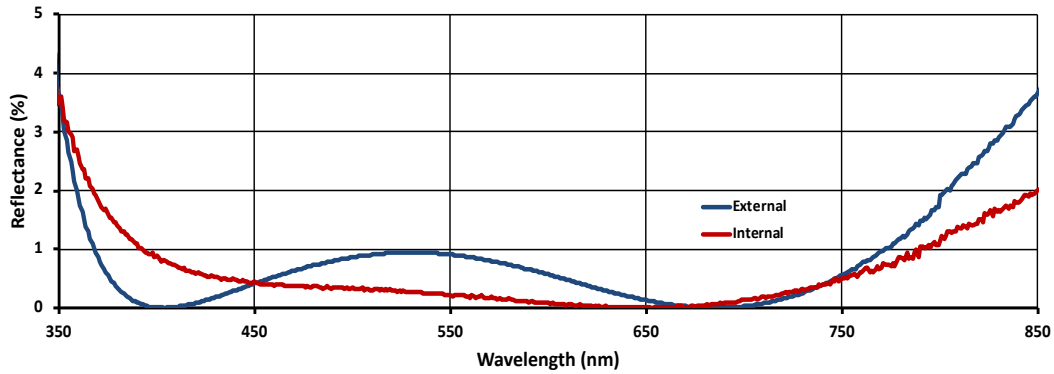
TECHNICAL SPECIFICATIONS

DSI's dark mirror coatings can be applied to virtually any substrate, in sizes up to 200mm diameter.

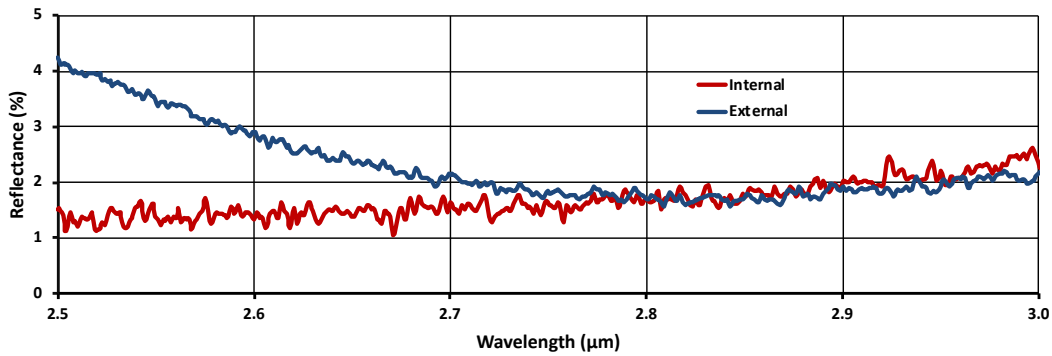
- Dark mirrors can be designed for low reflectance from the front of the optic (External), low reflectance at the substrate surface (Internal), or low reflectance from either direction (Bidirectional).
- Reflectance is often specified at less than 5%; but is generally held to much lower values. Achievable levels are highly dependent on the angle of incidence range as well as the wavelength range.
- Typical transmittance specifications range from $< 1\%$ to $< 0.01\%$. Furthermore, since the coatings contain one or more metal layers, very high blocking levels are attainable over broad wavelength ranges.
- Using photolithography, DSI can produce dark mirrors with feature sizes as small as $20\mu\text{m}$, and with $\pm 5\mu\text{m}$ placement accuracy.
- DSI's dark mirrors pass the MIL-STD environmental tests of adhesion, humidity, and moderate abrasion.

TYPICAL MEASURED PERFORMANCE

Bidirectional VIS/NIR Dark Mirror on Borofloat, $T < .02\%$



Bidirectional SWIR Dark Mirror on Sapphire, $T < 0.1\%$



External LWIR Dark Mirror on Germanium, $T < 1\%$

